

Microwave Inspection Nondestructive Imaging Array, Phase I

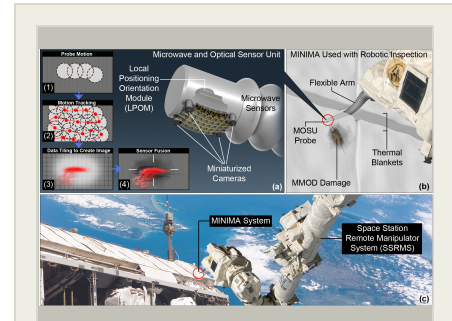
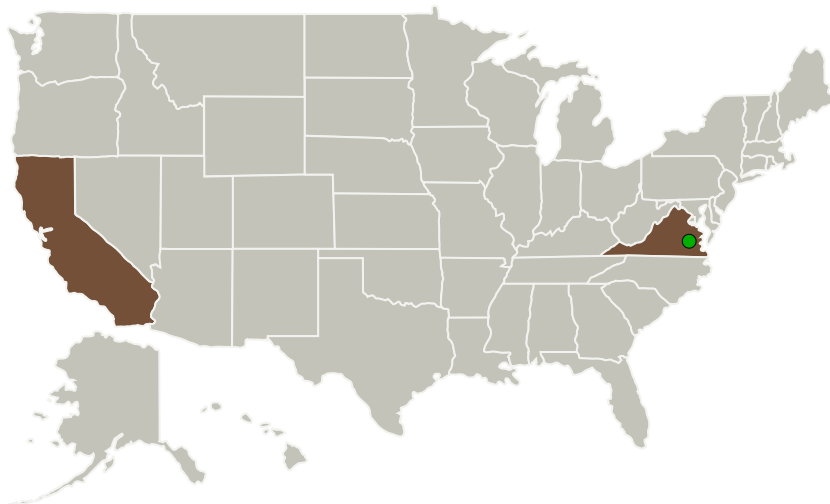
Completed Technology Project (2015 - 2015)



Project Introduction

To address the NASA need for advanced NDE sensor technologies for structural materials, Physical Optics Corporation (POC) proposes to develop a new Microwave Inspection Nondestructive IMaging Array (MINIMA), based on the novel integration of new compact near-field microwave imaging and optical sensors and comprehensive control and analysis software. The fusion of microwave and optical sensors provides a new capability to identify surface locations for further inspection and carry out those inspections with the ability to see through nonconducting parts. The highly integrated system design utilizes onboard position tracking and imaging sensors to track, register, and overlay microwave sensor data and optical imagery to precisely pinpoint defect data with respect to the actual part location and even other mechanical CAD models. In Phase I, POC plans to design the MINIMA system, define subsystem requirements, and develop algorithms for data fusion and registration based on modeling and simulation. We will assemble, test, and demonstrate a proof-of-concept prototype in a laboratory environment and include a short description for Phase II prototype. In Phase II, POC will refine the MINIMA design and develop an improved prototype for testing. We will develop full reports of development and test results along with a plan for applying the prototype to applicable structures.

Primary U.S. Work Locations and Key Partners



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Phase I

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Organizations Performing Work	Role	Type	Location
Physical Optics Corporation	Lead Organization	Industry	Torrance, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

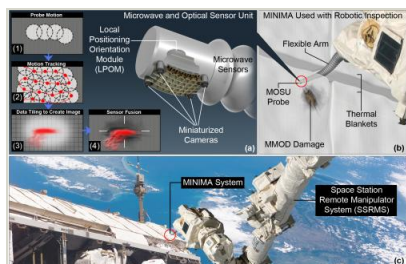
California	Virginia
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Project Transitions

**June 2015:** Project Start**December 2015:** Closed out**Closeout Summary:** Microwave Inspection Nondestructive Imaging Array, Phase I Project Image**Closeout Documentation:**

- Final Summary Chart Image(<https://techport.nasa.gov/file/139229>)

Images

**Briefing Chart Image**

Microwave Inspection
Nondestructive Imaging Array,
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(<https://techport.nasa.gov/image/136943>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Physical Optics Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

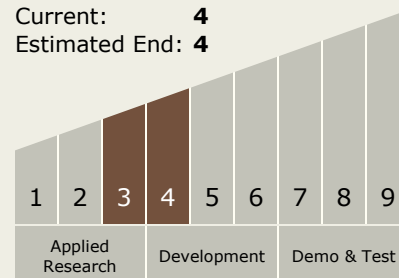
Carlos Torrez

Principal Investigator:

Marc Segall

Technology Maturity (TRL)

Start: 3
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.3 In-Situ Instruments and Sensors
 - └ TX08.3.1 Field and Particle Detectors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System